


EASTMAN



NEW
from Eastman Kodak...
EASTMAN
Magnetic
Sound
Recording
Film Type A704

"EASTMAN" ... synonymous with consistent reliability

"R-TYPE" BINDER provides dispersions of superb magnetic properties

IDENTIFIED AND CODED ... your assurance of highest quality

SPECIFICATIONS ... EASTMAN Magnetic Sound Recording Film, Type A704

SIZES, CORES, WINDINGS ... a complete range



Since the advent of motion pictures, "Eastman" has been synonymous with consistent reliability.

You who have used EASTMAN Motion Picture Film know of the unvarying high quality of its coatings from roll to roll. You have appreciated it because its results have been *predictable* and *completely dependable*. You know how imperative it is to work with a product whose physical characteristics—such as slitting and perforating—meet exacting specifications. Having witnessed the dynamic product changes that have occurred over the years, you also understand the importance of Eastman Kodak's continuing research and development programs and the industry-wide technical assistance policies that accompany each improvement.

And now, Eastman Kodak Company is proud to introduce an improved magnetic film—

EASTMAN Magnetic Sound Recording Film, Type A704

EASTMAN Magnetic Sound Recording Film is manufactured at Kodak Park, an industrial complex comprising more than 125 major manufacturing buildings occupying over 1,000 acres.

You'll certainly appreciate this film's outstanding performance because the *same* high-precision techniques used in the manufacture of Eastman sensitized products are employed in the coating of a new, highly-improved binder material.

... you'll find details on the following pages.

New From EASTMAN KODAK...

an improved
magnetic sound recording film

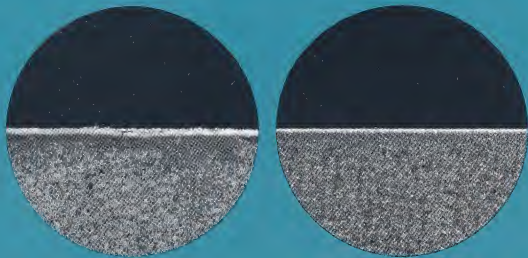
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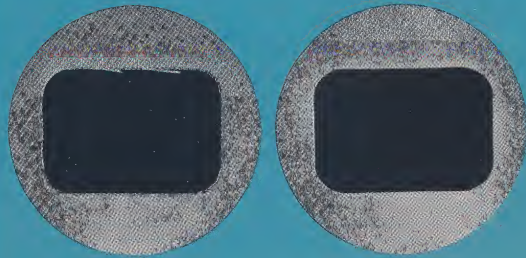
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The quality of edge slitting exerts great influence on ultimate audio quality; uneven tracking introduces intermodulation distortion. Note loose particles on rough guiding edge shown in photomicrograph of conventional film at left compared to evenness of EASTMAN Magnetic Sound Recording Film at right.



The quality of perforating also affects audio fidelity. Note the superior perforations of the Eastman product on right compared to the uneven perforations of conventional film at left. Eastman perforating is known for quality, for conformance to high standards and for exceptionally rigorous uniformity.

Through imaginative research, Eastman Kodak Company has developed an entirely new binder material — designated “R-type” — that permits oxide coatings of superb magnetic and physical characteristics. With conventional formulations, increased output has always been accompanied by increased print-through. However, the magnetic dispersion produced with the “R-type” binder is so superior that Type A704, while a *high* output magnetic film, has unusually *low* print-through characteristics.

Eastman Kodak's new binder offers a number of other important advantages:

- *It provides a cleaner, smoother, homogeneous oxide layer which dramatically suppresses noise and intermodulation distortion.*
- *It is characterized by a high degree of chemical stability making for exceptional longevity, and prolonging the usefulness of the recorded library.*
- *It is an extremely tough, wear-resistant material which prevents oxide build-up on recording and pick-up heads, and thus assures long-term excellence of performance.*

NEW “R-TYPE” BINDER...

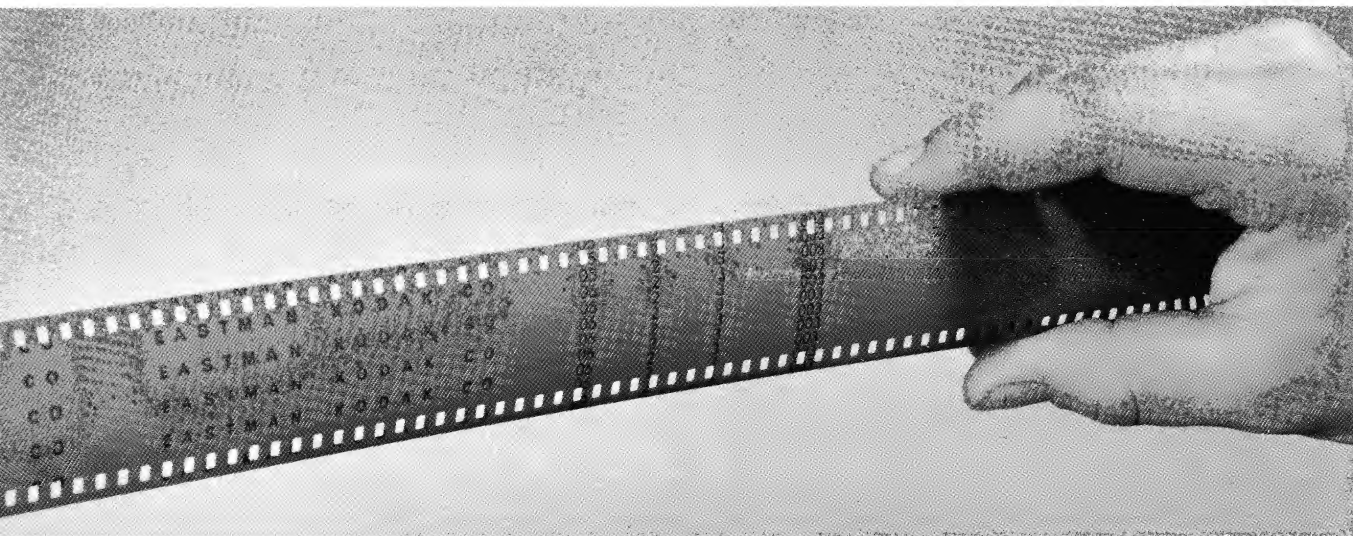
provides dispersions of outstanding magnetic characteristics

“R-TYPE” BINDER provides dispersions of superb magnetic properties

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Just as all EASTMAN Motion Picture Films are identified as to manufacturer and emulsion number, so, too, is the new magnetic film. Printed at regular intervals on the back of EASTMAN Magnetic Sound Recording Film is a permanent legend (see illustration) with the words "Eastman Kodak Co." This is followed by a series of dispersion code numbers which provide positive coating identification as an aid to quality control in manufacturing.

For the user, this unique coding along the entire length of the film is more than a guarantee of quality. It also provides a convenient means of indexing films by content and makes possible a permanently useful reference log of optimum bias settings, re-use data, purchase dates, etc. And most important to all critical users, the name *Eastman Kodak* provides solid, permanent assurance of highest quality.

Manufacturer's identification and dispersion code numbers—printed the entire length of the film—provide convenient, accurate method of referencing each roll of film.

New EASTMAN Magnetic Sound
Recording Film is

IDENTIFIED AND CODED...

your assurance of highest
quality in magnetic sound recording

IDENTIFIED AND CODED ... your assurance of highest quality

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General Properties

A magnetic recording film designed to give high output and a high signal-to-noise ratio, yet with an excellent print-through ratio. The unique binder material used provides magnetic dispersions of unusual abrasion resistance and produces a smooth-surfaced coating resulting in improved high-frequency sensitivity, low noise, and low amplitude modulation. High precision coating techniques and exacting manufacturing controls provide the ultimate in product uniformity.

Since no standard reference exists for perforated magnetic recording film, it is necessary to describe this film's bias level, sensitivity and frequency response in relation to EASTMAN Magnetic Sound Recording Film, Type A701. The output levels are referred to the ASA 400 cycle signal level test film PH. 22.132. The same magnetic layer is used for all coatings of Type A704; therefore, the relative values listed here apply to each of the available widths. The following definitions describe the standards against which each magnetic property was measured:

Bias Current—EASTMAN Magnetic Sound Recording Film is designed for use with standard magnetic film recording equipment at bias current levels within the operating range.

Nominal Bias—Bias current required for maximum output of a 400 cps signal recorded at a negligible distortion level (10 db below 2% third harmonic distortion).

Sensitivity—Output for a 400 cps signal recorded at a level 10 db below that which gives 2% third harmonic distortion, nominal bias.

Frequency Response—The db difference in output between a 400 cps signal and a signal of the frequency that results in 1.2 mil wavelength recorded with negligible distortion at nominal bias (6KC for 16mm and 15KC for 35mm and 17.5mm).

Maximum Operating Level—Output in db for which the third harmonic content of a 400 cps signal is 2% of the total, nominal bias.

Saturation Output—Maximum output obtainable irrespective of distortion, measured for a 400 cps signal recorded at nominal bias.

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Print-through Ratio—Measured with nominal bias at wavelength of 31 mils (print-through ratio is lowest at this wavelength for film having normal support and coating thickness). Recorded level is the same as the 2% distortion level. Film is recorded and incubated for four hours at 65°C without rewinding. The print-through is then measured.

Signal to Zero-Signal Noise Ratio—Ratio of saturation output to the noise level, measured with no audio input but with nominal bias current, over a frequency range of 200 cps to 15,000 cps.

Erase Ratio—Measured for a 1,000 cps signal recorded at the saturation level with nominal bias. The film is recorded, incubated for four hours at 65°C, and played back with the output recorded. The film is then passed through a 60 cps A.C. field of 1,000 oersteds, after which the level of the residual signal is measured. The difference between the signal before erasure and the residual signal is the erase ratio.

Magnetic Properties

Intrinsic Coercivity, H_c , (oe)	265	260
Retentivity, B_r , (gauss)	1,000	1,000
Nominal Bias (db)	+ 1.5	0
Squareness Ratio	76%	75%
Sensitivity (db)	+ .5	0
Frequency Response (db)	— .5	0
Max. Operating Level (db)	+ 5.0	+2.0
Saturation Output (db)	+12.0	+9.0
Print-through Ratio (db)	>56	56
Signal to Zero-Signal Noise Ratio (db)	80	75
Erase Ratio (db)	>65	>65

Physical Properties

Base Material	cellulose triacetate
Base Thickness	4.5 mils (nominal)
Oxide Thickness	0.4 mils (nominal)
Thickness Tolerance*	± 5%
Yield Strength**	10,000 psi
Tensile Strength**	13,000 psi
Elongation at Break**	35%
Tear Strength	34 grams
Coefficient of Expansion	

for 1°F change 3×10^{-5}

for 1% RH change 4×10^{-5}

*This tolerance represents the manufacturing limits for the base itself. In general, closer tolerances are met in any one roll.

**These values have been determined by the standard procedure ASTM-D882-61T. In actual practice, where perforated film is used on sprockets, the observed strength depends upon the fit and alignment of teeth in the perforations, strain rate, etc. Typical values for actual usage are as follows: 35mm — Yield and/or Tensile Strength: 20 to 55 lbs. 16mm — Yield and/or Tensile Strength: 10 to 20 lbs.

stock rolls	Core	Perforation Type*	Winding for 16 and 17½mm Rolls
35 mm x 1000 ft.	K	KS-1866	
17½mm x 1000 ft.	Z	KS-1R-1866	Winding B
16 mm x 1000 ft.	Z	1R-2994	Winding A
16 mm x 1200 ft.	Z	1R-2994	Winding A

rolls available but not regularly stocked

16 mm x 1000 ft.	Z	1R-2994	Winding B
17½mm x 1000 ft.	Z	KS-1R-1866	Winding A
16 mm x 1200 ft.	Z	1R-2994	Winding B
16 mm x 1000 ft.	Z	2R-2994	
16 mm x 2000 ft.	Z	2R-2994	

*Perforating of EASTMAN Magnetic Sound Recording Film is carried out to the same close tolerances as those used for EASTMAN Motion Picture Films. All rolls are wound on the cores with oxide coating in.

New EASTMAN Magnetic Sound Recording Film is available in a complete range of

**SIZES,
CORES,
WINDINGS**

SIZES, CORES, WINDINGS... a complete range

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

For further information

about EASTMAN Magnetic
Sound Recording Film, Type A704
and/or the new
EASTMAN Sound Recording Tapes
write:

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